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Abstract

We generalize the Cooper and Kaplanis (1994) methodology for estimating the costs that could reconcile international portfolio holdings with CAPM predictions. First, we simultaneously estimate inward and outward investment costs and even interactions between home and host country. Second, the risk aversion parameter is estimated rather than postulated. Third, we detect costs for domestic investments. We find that the home bias in equity portfolios is related to a mixture of market frictions, such as information asymmetries, institutional factors and explicit costs. Over the period 2001-2004, the average implicit investment costs range from 0.26 (US) to 16 (Turkey) percent per annum.

JEL classification: G11, G15, F36

Keywords: international portfolio diversification, information asymmetries, international CAPM

In this paper we build on Cooper and Kaplanis' (CK, 1994) idea of estimating a set of deadweight costs that can reconcile actual international portfolio weights with the predictions of the International CAPM (InCAPM). The CK approach provides point estimates of each country's cost of either inward or outward investments, conditional on a postulated value of relative risk aversion. In contrast, we adopt a regression approach: home bias depends on deadweight costs which, in turn, depend on regressors related to international transaction and information costs. The key advantage of this route is that we can measure far more. First, we can estimate simultaneously a home-country cost vector, a host-country one, and even interactions, thus ending up with a complete matrix of costs for all combinations of home and host countries. Second, we are able to estimate relative risk aversion rather than having to assume one. Third, we get more than just point estimates: we can in fact distinguish between coincidences or transient factors and more substantial ones, and we can therefore obtain confidence intervals and significance tests as to both the level of the implied overall deadweight costs and the contribution of the various variables to those overall costs. Fourth, we allow for costs of domestic investment too; and while we can still only estimate the differential cost of investing abroad versus at home, we are able to demonstrate that the domestic-investment cost does vary over countries and years and, therefore, is non-zero. The existence of such a cost may explain part of the equity premium puzzle or the divergence between risk-aversion estimates from mean returns versus from intertemporal studies or inflation-hedging asset demand. Fifth, we do not have to assume that the capitalization of domestic equity equals the wealth of a country. Lastly, in our computations we also tie up some loose ends in the original CK methodology, like the role of fixed-interest securities denominated in the various currencies.

None of this would have been possible without the better data that have become available since CK's work. We were also inspired by recent work on home bias—Berkel (2004), Coval and Moskowitz (1999), Faruqee, Lee and Yan (2004), or Portes and Rey (1999)—that tries to directly explain capital flows or deviations between actual portfolio holdings and InCAPM predictions. In a way, we even merge both approaches. Conducting this type of research firmly within portfolio theory instead of via stand-alone regression offers a neat and rigorous way of controlling for expectations, to which mean-variance portfolio weights are very sensitive, and for the correlations between each and every country's index. Also, our two-layer approach,

where the regressors affect portfolio choices via an implied cost, solves a thorny issue of how to specify the regression. Portfolio theory tells us that, if the information and cost regressors are to bear only on one home and one host country, the left-hand side variable should not be deviations between observed and predicted portfolio weights, nor percentage deviations between these, but differences between covariance risks of assets relative to two imperfectly diversified portfolios. This specification is not only better grounded in theory, but performs substantially better in practice too.

We find that the implied extra costs of foreign investments vary widely across countries, with plausibly modest figures for established market economies and much higher costs for emerging countries. Over the sample period, the estimates of the deadweight costs of exporting capital range between 0.26 percent (US) and 16 percent (Turkey). Informal, information-related costs play a much larger role than explicit cash items like trading costs. Longitudinal replication of the original CK method shows that costs have, generally, come down as one would expect.

The remainder of the paper is structured as follows. In the first section, we explain the methodology. In Section 2, we describe our data and motivate our choice for the variables affecting international investment costs. Section 3 discusses the empirical results.

I. The Model

Following Cooper and Kaplanis (CK, 1994), we consider a world with N countries and N currencies. Nominal returns are measured in terms of the Nth currency. There are N equity-index assets, $N-1$ fixed-interest foreign-currency assets and one risk-free domestic security, asset $2N$. The ordering of the countries is the same for the equity-index assets and currency assets, and both stock prices and exchange rates are risky processes. For each country l, there is a representative investor with a homothetic utility function. We assume that when an investor from country l holds stocks from country i, he experiences a proportional deadweight loss of $C_i^l \mathrm{d}t$ in the period $\mathrm{d}t$. This allows the costs of holding stocks to vary by investor and by asset. For the ith asset the net returns to investor l are given by

$$R_i^l := \frac{\mathrm{d}V_j}{V_j} - C_i^l \mathrm{d}t = \left(\mu_i - C_i^l\right) \mathrm{d}t + \sigma_i \mathrm{d}z_i, \qquad i = 1, ..., 2N-1, \tag{1}$$

where μ_i and σ_i are the annualized expectation and standard deviation of the nominal rate of return on this asset respectively, and $\mathrm{d}z_i$ is the increment to a standard Wiener process. For notational convenience, dividends and foreign interest are assumed to be capitalized, so that they are included in μ.

The cost of living of an investor of country l, P^l, expressed in the reference currency follows a Brownian motion:

$$p^l := \frac{\mathrm{d}P^l}{P^l} = \Pi^l \mathrm{d}t + \sigma_\pi^l \mathrm{d}z_\pi^l, \qquad l = 1, ..., N, \tag{2}$$

where Π^l and σ_π^l are the annualized expected value and the standard deviation of the instantaneous rate of inflation and $\mathrm{d}z_\pi^l$ is the increment to a standard Wiener process. Under these assumptions, the optimal portfolio weights of risky assets for any investor l are

$$x^l = \alpha\, \Omega^{-1} \left(\mu - r\underline{1} - C^l\right) + (1-\alpha)\, \Omega^{-1} w^l, \tag{3}$$

where

x^l =$(2N-1) \times 1$ vector of the proportions of investor l's wealth invested in each risky asset

α = relative risk tolerance

Ω = $(2N-1) \times (2N-1)$ *p.a.* covariance matrix of the nominal rates of return on the risky securities

$\underline{1}$ =$(2N-1) \times 1$ vector of elements all equal to unity

w^l = $(2N-1) \times 1$ vector of covariances of the risky asset returns with investor l's rate of inflation.

We now extract the demand for stocks from the above demand equations. Following Sercu (1980), the covariance matrix of risky asset returns is partitioned into:

$$\Omega = \begin{bmatrix} \Omega_S & \Omega_{SX} \\ \\ \Omega'_{SX} & \Omega_X \end{bmatrix},$$

where Ω_S is the covariance matrix of the N stocks and Ω_X is the covariance matrix of the $N-1$ exchange-rate changes. Familiarly, the inverse of the partitioned covariance matrix can

then be interpreted as:

$$\Omega^{-1} = \begin{bmatrix} \Omega_{S|X}^{-1} & -\Omega_{S|X}^{-1}\Gamma' \\ \\ -\Gamma\Omega_{S|X}^{-1} & \Omega_X^{-1} + \Gamma\Omega_{S|X}^{-1}\Gamma' \end{bmatrix},$$

where Γ' is a $N \times (N-1)$ matrix, each row containing the $(N-1)$ multivariate slope coefficients in the regression of the equity return indices on all exchange rate changes and $\Omega_{S|X}$ is the $N \times N$ covariance matrix of the errors of these N regressions. Γ is the matrix of Stein (1961), Johnson (1960) hedge ratios and $\Omega_{S|X}$ is thus the covariance matrix of the stock returns hedged against exchange risk. This means that we can rewrite the first N rows in equation (3) as

$$x_n^l = \alpha\, \Omega_{S|X}^{-1} \left[\left(R_{e,S} - C^l \right) - \Gamma' \left(R_{e,X} \right) \right] + (1-\alpha)\, \Omega_{S|X}^{-1} w_{S|X}^l, \tag{4}$$

with $R_{e,S}$ the vector of excess equity returns, $R_{e,X}$ the vector of excess currency returns (including foreign interest) and $w_{S|X}^l$ the vector of the covariances of investor l's rate of inflation with the N hedged stock returns.

In the OECD data used by CK, only one element of a country's x_n^l is available, the own-country investment. So they have in total N observations to estimate potentially N^2 pairwise costs. As a result of these data limitations they can either estimate inward costs, or outward costs, but never both simultaneously, and surely no interactions. We, in contrast, have a full $N \times N$ data matrix, which would enable us to compute an unconstrained $N \times N$ matrix of costs. Those, however, would just be point estimates with zero degrees of freedom. We prefer a regression structure that leaves us degrees of freedom, and allows us to distinguish between coincidences or transient factors and more substantial ones.

The deadweight costs of investing abroad have three sources. The first component is home-country related (the l-th home effect), including primarily the shadow cost of controls on capital outflows. The second component is related to the host country (the i-th foreign effect), like trading costs and the impact of capital import controls. The third component is an interaction effect; for instance, withholding costs as laid down in bilateral tax treaties are specific for the pair (i, l). But we also recognize that domestic investments may have nonzero costs, even though they are likely to be substantially lower than the costs of international investments. For riskfree lending and borrowing, lastly, there is assumed to be no cost. Below, we denote variables that are correlated with international costs by h_l (for the home variables), f_i (for

the foreign variables) or $a_{i,l}$ (for interactions), and variables that explain domestic costs by d_l. Then

$$C_i^l = \begin{cases} D(d_l) & , \text{ if } i \leq N \text{ and } i = l, \quad \text{(domestic stocks)} \\ C(h_l,\, f_i,\, a_{l,i}) & , \text{ if } i \leq N \text{ and } i \neq l, \quad \text{(foreign stocks)} \\ 0 & , \text{ if } i > N \qquad\qquad \text{(fixed-interest).} \end{cases}$$

The demand model in Equation (4) is not yet suited for regression analysis since every single observation x_i^l depends on expected returns and costs for all host countries i simultaneously. Also, expectations and hedge ratios Γ are hard to estimate. Obtaining an equation where each left-hand-side observation depends just on one C_i^l, rather than on all, is possible by studying covariances with l's portfolio rather l's portfolio weights themselves. We simply premultiply each side of equation (4) by $-\Omega_{S|X}$ and denote the resulting covariance by (minus) y^l:

$$y^l := -\Omega_{S|X} x_n^l = \alpha \left(-R_{e,S} + C^l + \Gamma' R_{e,X} \right) - (1-\alpha)\, w_{S|X}^l, \tag{5}$$

Formally, equation (5) can be understood as:

$$\operatorname{cov}\left(R_i, R_{p(l)}\right) = \alpha \left(R_i^h - C_i^l \right) + (1-\alpha) \operatorname{cov}\left(R_i^h, \Pi^l \right), \tag{6}$$

which says that the covariance of asset i's return with the return of the portfolio chosen by investor l is linearly related to the net return of the hedged stock and the covariance of the hedged stock return with investor l's inflation rate. Equation (5) gives us a structure where each y_i^l depends only on the costs of flows from home l to host i, not to other hosts k. Our procedure also takes into account all (co)variances in a structured and parsimonous way. In contrast, in a simple regression analysis of x_i^ls one can, at best, bring in just the (co)variances for l and i as regressors, and in an additive way. As a welcome byproduct, bringing $\Omega_{S|X}$ to the left-hand side has also incorporated the estimation errors that are present in $\widehat{\Omega}$ into the regressand instead of the regressor.

We now eliminate the expectations and gammas. Below, we write the equation for residence country l and host country i, we compare it to the equation for residence country i and asset

i, and lastly we subtract to get the equation used for estimation:

$$\begin{aligned} y_i^l &= \alpha\left(-R_{e,S_i} + C(h_l,\, f_i,\, a_{l,i}) + \Gamma_i' R_{e,X}\right) - (1-\alpha)\, w^l_{S_i|X}, \\ y_i^i &= \alpha\left(-R_{e,S_i} + D(d_i) \qquad\quad + \Gamma_i' R_{e,X}\right) - (1-\alpha)\, w^i_{S_i|X}; \\ \Rightarrow (y_i^l - y_i^i) &= \alpha\left[C(h_l,\, f_i,\, a_{l,i}) - D(d_l)\right] + (1-\alpha)\left(w^i_{S_i|X} - w^l_{S_i|X}\right). \end{aligned} \tag{7}$$

Eliminating expectations by taking $(i,\, i)$ as the benchmark instead of the world average, as is standard, very much simplifies the regression without any extra loss of degrees of freedom. With 20 regressors and 40 countries, introducing the mean cost would have been quite cumbersome.

II. Data

Data on international portfolio holdings are from the Coordinated Portfolio Investment Survey (CPIS), conducted annually by the IMF since 2001. For each participating country, the CPIS reports data on foreign equity portfolio holdings by residence of the issuer. The CPIS data substantially reduces the data shortcomings that existed during earlier decades. However, problems with the CPIS data can arise for at least two reasons. First, a number of countries did not participate to the CPIS resulting in a incomplete country coverage. Among those non-participants are for example China and the Arab countries. Second, there can be an issue of under-reporting by CPIS participants. The German survey for example did not cover holdings by households unless they are managed by a professional. Other problems are related to data on country characteristics. Out of the 70 countries participating the CPIS in 2004, only 36 could be retained in this study due to missing data in Datastream.

Table I shows the relative importance of each stock market compared to the world market capitalization and the proportion of domestic equity held in the total equity portfolio at the end of 2004.[1] The home bias can be obtained by subtracting the former from the latter.

To calculate the returns on the equity markets, we composed a value-weighted index for each country containing all domestic stocks. Stock data are from an international equity list from

[1]Data for 2001, 2002 and 2003 are similar and can be obtained from the corresponding author.

Table I: **Home bias in equity portfolios based on CPIS data, December 2004.** Portfolio holdings data are from the CPIS. Market capitalizations are from Datastream. The home bias in equity portfolios is calculated by subtracting the proportional market capitalization from the proportion of domestic equities in a countries portfolio.

Country	*Market capitalization as a percentage of total*	*% of equity portfolio in domestic equities*	*Home Bias*
Austria	0.25	62.15	61.90
Belgium	0.80	71.02	70.22
Brazil	0.93	99.48	98.55
Canada	3.33	76.97	73.63
Chile	0.33	95.39	95.06
Colombia	0.07	99.33	99.26
Czech Republic	0.15	96.59	96.44
Denmark	0.44	68.15	67.71
Finland	0.52	70.99	70.47
France	6.60	84.11	77.52
Germany	3.38	73.91	70.53
Greece	0.34	96.47	96.13
Hong Kong	2.44	91.43	88.99
Hungary	0.08	96.35	96.27
Indonesia	0.21	99.96	99.75
Israel	0.26	94.84	94.58
Italy	2.23	81.58	79.35
Japan	10.07	90.76	80.70
Korea	1.10	98.76	97.65
Malaysia	0.51	99.47	98.95
Netherlands	1.53	37.17	35.64
Norway	0.40	51.10	55.94
Philippines	0.08	99.43	99.35
Poland	0.20	99.46	99.26
Portugal	0.31	90.88	90.57
Russia	0.58	99.96	99.38
Singapore	0.62	81.03	80.41
South Africa	1.25	90.46	89.21
Spain	2.66	92.05	89.39
Sweden	1.07	67.94	66.87
Switzerland	2.34	79.92	77.58
Thailand	0.33	99.52	99.19
Turkey	0.28	99.90	99.62
United Kingdom	8.11	74.66	66.55
United States	46.19	88.09	41.90
Venezuela	0.02	99.71	99.69
TOTAL	100.00		

Datastream, developed by Lieven De Moor (2004) that contains data from 1980 to December 2000. Stock prices after December 2000 are from the Morgan Stanley International Country Indices. All stock prices and CPI are in USD. We use ten years of monthly data to calculate the conditional covariances of risky asset returns and inflation rates.

A detailed description of and motivation for the variables that are used to estimate the costs of international investment is listed below. We subdivide each set of regressors into four groups: one related to implicit costs from information asymmetries; a second related to explicit trading costs and direct controls on international capital flows; a third measures of financial development, which probably correlate negatively with both information asymmetry and transaction costs; and, a fourth measures the skewness of the return of the host country. Most of the variables have been used before, notably by Berkel (2004), Coval and Moskowitz (1999), Faruqee, Lee and Yan (2004), or Portes and Rey (1999).

A. Implicit, information-related frictions

Information about the domestic economy can be acquired at a lowish cost by regular reading of the local press and normal business activities, while information about foreign economies is more difficult to acquire (e.g. subscriptions to foreign newspapers or translations, Brennan and Cao, 1997). French and Poterba (1991) show empirically that the effects of information asymmetries between countries on the portfolio composition are similar to those of a return gap of several basis points between domestic and foreign markets. Information asymmetries between countries still exist today, despite the existence of internet and satellites that allow almost instantaneous communication between countries. Portes and Rey (1999) study the determinants of international equity flows. They find that market size, efficiency of transactions and distance are the most important determinants of transaction flows. They show that distance has all the symptoms of being a proxy for information asymmetries and conclude that the market segmentation is mainly caused by asymmetric information between investors rather than by transaction costs. La Porta, Lopez-de-Silanes and Shleifer (1998, 1999) suggest that company ownership is more dispersed in countries with a good legal protection of minority shareholders. Dahlquist, Pinkowitz, Stulz and Williamson (2003) show that differences in corporate governance across countries can partly explain the home bias. Additionally, Erb, Harvey and Viskanta (1996) show that political risk measures contain some information on asset returns, at least for emerging markets. In a recent empirical study, Goetzmann and Kumar (2005) explain underdiversification by investor-specific characteristics. Using a sample of 40,000 US private investors, they find that age and income correlates positively with the

level of portfolio diversification. Over-confidence and familiarity or local bias leads to under-diversification. Neither transaction costs nor data acquisition costs do not significantly limit portfolio selection. Instead, the real challenge is to transform data into information.

In this paper we assume information costs to be a broad category of market frictions. They not only contain adverse selection effects (effects of information asymmetries on expected returns), but also the effects of information asymmetries on the variance of the returns that result from different risk perceptions between domestic and foreign investors.

Information costs can not be measured or quantified directly; therefore we introduce a number of variables that can approximate either the ease with which information can be obtained or the complexity of the situation.

A.1 Host-related information variables f_i in $C(h, f, a)$

Host-country GDP. Large, rich countries are more likely to be considered as attractive because in general investors hear more about them and have more confidence in them. For example, Faruqee, Li and Yan (2004) show that market size, measured by the GDP and the number of publicly listed companies, significantly influences international portfolio holdings. We expect that the GDP of the host country has a negative correlation with investment costs.

English-language dummy. We add an indicator that equals unity if the country of host has English as official language. English being the dominant world language, information flows more easily from these countries than towards them, so this lowers the cost of investing into them.

The next three items refer not to information availability but to the degree of uncertainty (and hence potential information asymmetry and adverse selection):

Host-country misery index. A country's misery index is the sum of its inflation and unemployment rates. Initiated by Robert Barro in the 1970's, it measures a country's degree of macro-economic distress, which adds to uncertainty about future policy and hence to information costs. (It could also be interpreted as a "sentiment" variable, but the distinction with adverse selection is subtle, here.) So we expect that the higher the misery index for a country, the higher the implicit costs to invest into that country.

Financial-crisis indicator. Some countries suffered from a financial crisis in the recent past: Brazil (1999), the Asian countries (1997), Russia (1998) and Venezuela (1997). For the host country, a recent crisis adds to uncertainty and increases the shadow cost of investing to them.

Host-country GDP growth. GDP-growth of the host country is measured as the mean rate over the preceding three years. Its effect on investment costs is uncertain. Everything else being the same, we expect fast growing countries to be more attractive to international investment if "sentiment" plays a role. However, high growth may mean more uncertainty and hence higher information and adverse-selection costs. For one thing, most fast growing countries are also emerging countries, about which information is scarce and where uncertainties are often large. In addition, high expected growth leads to high stock-price multiples, which makes markets quite sensitive to variations in expected growth.[2]

Political risk measure. We add two variables to account for the political risk of the host country. The Opacity index developed by PricewaterhouseCoopers is an average of five risk measures: a corruption-indicator, a measure for legal and judicial opacity (including shareholder rights), an indicator of economic and policy opacity, an indicator for accounting or corporate governance opacity and a factor that refers to the impact of regulatory opacity and uncertainty.[3] High values on the opacity index indicate a lack of clear, accurate and widely accepted practices in capital markets, thus we expect the opacity index of the host country to correlate positively with investment costs. A second political risk indicator is the International Country Risk Guide Political Risk Index (ICRGP) published in Erb *et al.* (1996). It contains 13 political risk factors like indicators of political leadership, political terrorism, economic planning failures and divergences between economic expectations and reality. Higher values on this index indicate low political risk, thus we expect this variable to correlate negatively with investment costs.

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[2]Consider for instance the Gordon model, which says that the prospective price-earnings ratio is $P_t/\hat{X}_{t+1} = 1/(R-g)$, with R the discount rate and g the growth rate. The growth elasticity of P/E then equals $g/(R-g)$, which rises sharply in g.

[3]www.opacityindex.com.

A.2 Interaction-type information variables $a_{i,l}$ in $C(h, f, a)$

Distance. Following Portes and Rey (1999), Coval and Moskowitz (1999) and Berkel (2004), we use the physical distance between countries as a first proxy for the costs of obtaining information about foreign markets. The distance between countries is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities or agglomerations (in terms of population). Our source is the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII).

Common-language indicator. Countries that share a common language have a potential information advantage on countries where the languages are different. We include a dummy variable which is equal to unity if two countries share a common language, and expect it to have a negative effect on the costs of international investments. The language dummies are also from CEPII.

Same-region indicator. Following a similar reasoning as for language, dummy variables are added to account for whether two countries are situated in the same region. As in Berkel (2004), we classify the countries by region and construct region dummies. The regional classification of the countries can be found in the Appendix.

Euroland indicator. Lastly, we create a Euro-dummy for the ten countries in our sample that share the same currency. Since the introduction of the fixed exchange rate on January 1, 1999, the level of financial integration between the member countries has increased due to the absence of exchange rate risk, the increase of in cross-country banking, and the reduction of transaction costs. Thus we should expect that the asymmetry of information between those countries has reduced.

There is a wide range of other variables that one can think of being a proxy for information asymmetries. For example, we have worked with an index of insider trading, a US dummy, a dummy variable for countries that have a common colonial background, share a border or belong to the same legal family. Our final selection was based on multicollinearity issues and, of course, significance and statistical fit of the data.

A.3 Home-related information variables d_l and h_l

While we can only measure the difference between foreign- and home-investment costs, we can still add control variables that could pick up circumstances where domestic costs are higher or lower than average. This eliminates noise from the C estimates, and also provides information as to whether domestic-investment information costs do vary; if so, this finding would confirm these costs are non-zero. An increase in domestic costs $D(d)$ has the same effect as a fall in foreign costs $C(h, f, a)$.

The home-related information costs mirror the host-related variables: *Home-country GDP* is a more ambivalent variable than the host country's GDP. On the one hand, world leaders are often also the countries with a high level of technological and financial development, which makes it easier and cheaper for investors to obtain information and do the actual investments abroad. This has a downward effect on foreign investment costs, mirroring the effect of a small host GDP. On the other hand, large economies tend to be more introvert. One argument is that investors from large economies have better diversification opportunities inside their own country already, making international diversification less necessary. True, this effect should already be picked up by the variance-covariance matrix that is incorporated into our dependent variable. But there is likely to be an interaction with information processing too. Residents from, say, Luxembourg, do not need quite as much time to digest all relevant local news as US portfolio managers, so they naturally spend more of their day on foreign news. This effect is not picked up by the covariance matrix, and would make small countries more extravert than large ones even after accounting for (co)variance effects.

There is less ambivalence with the other variables. A high value for the *home-country misery index* and the *home-country opacity index* and a low value for the *home-country ICRGP-index* increases the uncertainty about domestic assets, thus increasing home investment costs and decreasing the net extra cost of foreign investments, everything else being the same. The same holds in case of a unit value for the domestic *financial-crisis indicator*, signaling a recent crisis in the home country. So we expect that a high value for the domestic misery index, or a recent crisis, lowers the differential information cost of moving funds out.

Our second group of regressors, after these related to information costs, refer to explicit fric-

tions.

B. Explicit frictions: transaction costs and capital restrictions

The items not related to information costs consist of estimated direct costs of trading, and the shadow cost of quantitative restrictions.

B.1 Trading costs.

Domowitz, Glen and Madhavan (2001) report the trading costs for a wide range of countries between 1996 and 1998. They show that emerging markets have significantly higher transaction costs. This large trading-cost differential between developed and emerging markets can limit the gains from international diversification. We use transaction cost data provided by Elkins/McSherry Co., Inc., published in Institutional Investor and Degryse and Van Achter (2002). For the Russian Federation there was no data available, so we approximated the transaction costs in Russia by the average of trading costs in the Czech Republic, Poland and Hungary.

Foreign trading costs are expected to be positively correlated with the costs of foreign investment $C_i^l()$. *Domestic trading costs* are ambivalent. On the one hand, when domestic trading costs are high, it is more attractive to invest in another country if trading costs are lower there. On the other hand, foreign investments are often routed through domestic brokers; so for residents of countries with high transaction costs also outward investments are likely to be expensive. That is, it is possible that they add to both $D^l()$ and $C_i^l()$, leaving only a small or zero impact on the net cost differential.

The second group of explicit frictions are the effects of controls on international capital flows.

B.2 Direct controls on capital flows.

Although the incidence of capital controls has dwindled since the eighties, they are still around, especially in less developed economies. In periods of financial crisis, some countries have reinstated such restrictions. Malaysia, for example, had a comparatively liberal investment regime before 1998, but in 1998-1999 a wide range of direct capital and exchange controls was

introduced with the aim of restricting the supply of ringgits to speculators and preventing heavy capital outflows by residents and nonresidents.

A large number of studies have tried to measure the level of capital account openness (see Minaine (2004) for an overview). Most measures rely on the 0/1 dummies provided by the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), such as the index of Lane and Milesi-Ferretti (2001). Unfortunately, this capital-openness measure hardly takes the intensity of capital controls into account, and tries to summarize restrictions on both inflows and outflows by one single number. Edison and Warnock (2003) compute the ratio of total market capitalization of stocks available to foreign investors over total market capitalization, but this index captures only one aspect of the intensity of capital controls, is available only for certain emerging countries and does not provide any information on restrictions on outflows. We want a separate index for outward and inward controls, with maximal country coverage. Thus from the AREAER dummies we develop two new indices ourselves, one for inflows and one for outflows, by counting how many of 15 possible restrictions were adopted by the country. Details on the construction of our measures of capital controls can be found in the Appendix. Obviously, capital controls on both inflows and on outflows are expected to have a positive impact on the costs on international investment.

Our third group of regressors refer to measures of financial development

C. Financial development

Channeling savings to where they can be invested most efficiently requires established payment systems; the availability of information on the economy, the companies and the asset prices; and a way to manage and to control risk. Equity prices are more informative in well developed financial markets. Thus, financial development is likely to be associated with both lower information costs and lower explicit frictions.

Common measures for financial development are the ratio of private credit provided by the banking sector to GDP or the ratio of M2 to GDP. These measures focus on the banking sector. They might not be appropriate to measure financial development of the equity markets because a well developed or very large banking sector does not always imply that the equity

markets are well developed. In fact, banking and stock markets can be substitutes—think of Germany. Therefore, we create a new measure that is equal to the sum of domestic credit provided by the banking sector and stock market capitalization divided by GDP. Market cap is obtained from Datastream, and annual data on the domestic credit provided by the banking sector are from World Development Indicators.

Stock-market liquidity is known to be a major determinant of bid-ask spread in order-driven markets, and of price pressure in price-driven markets. But it is also correlated with volatility and the prevalence of insider trading, two information-related variables. Either way, a high liquidity lowers costs. So higher *host-country liquidity* lowers the total expense of investing there, and higher *domestic liquidity* increases comparative outward costs. We measure liquidity as the ratio of annual turnover over market capitalization. Annual turnover is obtained from Datastream.

We lastly turn to a variable to capture the skewness in stock returns.

D. Return skewness

Finally, we add standardized skewness for the return of the host-country, to capture non-gaussian features in the distribution. We expect that investors prefer positive skewness in returns, thus this variable is expected to have a negative effect on investment costs.

Table II summarizes the variables that are used to estimate the costs of international investment, together with their expected sign of correlation with these costs.

III. Estimation and Results

A. Estimation

The test equation (7) has as its left-hand side variable the differential portfolio covariance risks of asset i for investors l and i, and on the right the net cost differential $NC(H_{l,t}, F_{i,t}, A_{l,i,t}, D_{l,t})$ and the asset's differential inflation-hedging potential:

$$\left(y_i^l - y_i^i\right)_t = \alpha\, NC(H_{l,t}, F_{i,t}, A_{l,i,t}, D_{l,t}) + (1-\alpha)\left(w^i_{S_i|X} - w^l_{S_i|X}\right)_t$$

Table II: **Definition of the variables**

Variable		Exp. Sign	Description
Int. investment costs $C(H_l,F_i,A_{l,i})$			
– *Information-related*			
Host	GDP	–	GDP of the host country relative to world GDP
	English-speaking	–	Dummy if the host country has English as official language
	Misery index	+	Annual inflation rate + unemployment rate of the host country
	Crisis	+	Dummy if the host country suffered from a financial crisis recently
	Opacity index	+	Opacity score of the host country (PricewaterhouseCoopers)
	ICRGP index	–	International Country Risk Guide Political Index
	GDP–growth	?	3-year annual average GDP-growth of the host country
Interaction	Common language	–	Dummy if home and host country share the same language
	Common region	–	Dummy if home and host country are situated in the same region
	Euroland	–	Dummy if home and host country are Euroland members
	Log(distance)	+	Logarithm of the physical distance between the home and the host country
– *Fin. development*			
Host	(Bank+Cap)/GDP	–	Dom. credit provided by banks plus stock market cap relative to GDP
	Liquidity	–	Stock market turnover relative to stock market capitalization of the host county
– *Explicit frictions*			
Host	Transaction costs	+	Elkins/McSherry Co., Inc. transaction costs of the host country
	Capital-import ctrls	+	Index of controls on capital inflows
Home	Capital-export ctrls	+	Index of controls on capital outflows
– *Return skewness*			
Host	Skewness-indicator	–	Skewness of the return of the host country
Domestic investment costs $D(D_l)$			
– *Information-related*			
	GDP	?	GDP of the home country relative to world GDP
	Misery index	–	Annual inflation rate + unemployment rate of the home country
	Crisis	–	Dummy if the home country suffered from a financial crisis recently
	Opacity index	–	Opacity score of the home country (PricewaterhouseCoopers)
	ICRGP index	+	International Country Risk Guide Political Index
– *Explicit frictions*			
	Transaction costs	– or 0	Elkins/McSherry Co., Inc. transaction costs of the home country
– *Financial Development*			
	(Bank+Cap)/GDP	?	Dom. credit provided by banks plus stock market cap relative to GDP
	Liquidity	+	Stock market turnover relative to stock market capitalization of the home country

where $H_{l,t}, F_{i,t}, A_{l,i,t}$ and $D_{l,t}$ are vectors containing the sources of home-related costs, host-related costs, interaction-type costs and domestic costs respectively.

We specify the costs of international investment as an exponential function of the above regressors. This guarantees that fitted costs end up as positive numbers. It also minimizes the impact of the estimate of risk tolerance on the estimated coefficients. Indeed, only the constant in the exponent (c, below) must be inferred using the estimate of α obtained from the inflation-covariance terms; the other coefficients of the cost function are not directly affected by the estimated α:

$$\begin{aligned}\left(y^{l,i}-y^{i,i}\right)_t &= \alpha \times \exp\left(c+\sum \beta_j X_j\right)+(1-\alpha)\left(w^{i,i}_{S|X}-w^{l,i}_{S|X}\right)_t \\ &= \exp\left(\overline{c}+\sum \beta_j X_j\right)+(1-\alpha)\left(w^{i,i}_{S|X}-w^{l,i}_{S|X}\right)_t, \end{aligned} \tag{8}$$

where $\overline{c}=c+\log(\alpha)$ and $X=[H,F,A,D]$.

We estimate equation (8) using the General Method of Moments (GMM) with a Newey-West weighted covariance matrix such that the GMM-estimates are robust to heteroskedasticity and autocorrelation. All right hand sides variables of equation (8) are used as instruments. We estimate the model on the full sample 2001-2004 and on two subsamples 2001-2002 and 2003-2004. As a robustness check, we also test the model imposing a simple linear cost structure.

B. Empirical Results

Table III summarizes the estimation results of equation (8) for the full sample and the two subsamples. First note the general explanatory power: of the variance of the $\Delta y^l_{i,t}$ observations, 74 percent is explained. This compares favorably with direct regression analysis of $\Delta x^l_{i,t}$ numbers, like in Berkel (2004), where R^2s obtained with very similar regressors are between 15 and 25 percent. Stated differently, a substantial part of the variation in investment biases $x^l_{i,t}-\overline{x}_{i,t}$, the variable studied by Berkel, is related to variance-covariance effects, and once this is sorted out the remaining differential covariance risks y^l-y^i can be well explained by the regressors.

Our second introductory observation is that, across the years, there is a reassuring degree of consistence in the values of the coefficients and the patterns of significance/insignificance. Third, relative risk aversion is estimated to be significantly positive. As α is not significantly

different from unity, we find, similar as CK, that the inflation-hedging component does not seem to explain much. However, in the linear model, α is significantly different from unity which suggests that the inflation hedging factor can not be ignored entirely. Significant risk tolerance of course means a significant estimated relative risk aversion. Our estimates of relative risk aversion range between 0.9 and 1.1, or, when we use year-by-year estimation (not shown), between 2.2 and .8. This is low relative to estimates from expected returns; but gross expected returns are suspect if there are trading and information costs. Our numbers are in line with Lucas (2003), who approaches relative risk aversion from the relation between real interest rates and real consumption growth and calculates that relative risk aversion cannot be higher than 2.5, and with the estimates by Apte *et al.* (2004), extracted from real exchange rates and real consumption data. The alternative of fixing relative risk aversion at some predetermined level, as in CK, has the drawback that its estimation error margin is ignored in the t-tests for the other regressors, which would have overstated the significance levels.

The main interest is, of course, in the determinants and levels of transaction costs. We discuss these in turn.

B.1 Determinants of costs

Information-related frictions significantly influence implicit deadweight costs during the sample period: fifteen out of sixteen information-related variables turn out to be significant. Among the host-country regressors that are expected to correlate with costs of investing abroad, the misery index, the opacity index, GDP growth, and crisis variables are significant and have positive coefficients, suggesting that they all increase uncertainty and the costs that go with it. Host-country GDP and the English-language indicator both come up with a significantly negative sign, as expected, but the English language indicator is no longer significant in the subsamples. The two political risk variables show contradicting evidence and the ICRGP-index has varying impact across the three estimations. One reason seems to be that the variables are too similar and cause multicollinearity problems: when we drop the PwC opacity measure (not shown), the coefficient for ICRGP behaves as expected.

On the home-country side, the signs mirror those for the host: GDP comes up with a positive sign. So high-GDP countries are more introvert than small ones, over and beyond what

Table III: **Coefficient estimates and t-statistics**

The estimated model is that of equation (8). The second column contains the GMM estimation results for the full sample period. Columns three and four contain the results of the subperiods. The estimation results of the linear costs structure are reported in the last column. Significance at the 99%, 95%, and 90% level is denoted by three, two and one star respectively

Variable		Exp. Sign	**Whole Period** Coefficient		t-stat	**Subperiod 2001-2002** Coefficient		t-stat	**Subperiod 2003-2004** Coefficient		t-stat	**Linear cost structure** Coefficient		t-stat
Inflation hedging (α)		+	1.07	***	5.06	1.07	***	4.53	0.91	***	3.04	1.489	***	9.12
Constant ($\log(\alpha)+c$)		?	–7.54	***	–21.50	–8.83	***	–24.49	–4.41	***	–11.18	–0.002	*	–1.73
Int. investment costs $C(H_l, F_i, A_{l,i})$														
– Information–related														
F_i	GDP, host	–	–4.86	***	–15.32	–4.21	***	–9.50	–5.12	***	–9.60	–0.003	***	–7.62
	English–speaking host	–	–0.20	***	–3.70	0.07		1.16	–0.01		–0.11	0.001	***	6.97
	Misery index, host	+	0.03	***	24.46	0.04	***	45.14	0.05	***	27.90	0.000	***	8.79
	Crisis, host	+	0.59	***	29.69	0.83	***	31.38	0.43	***	12.21	0.002	***	9.32
	Opacity, host	+	0.02	***	10.75	0.01	***	8.41	–0.03	***	–14.86	0.000	**	2.19
	ICRGP, host	–	0.01	***	3.88	0.02	***	11.75	–0.01	***	–6.46	0.000	***	3.54
	GDP–growth host	?	0.71	***	8.19	0.20	***	3.04	3.94	***	20.40	0.005	***	6.03
$A_{l,i}$	Same language	–	–0.50	***	–9.68	–0.51	***	–7.61	–0.46	***	–6.10	–0.001	***	–6.47
	Same region	–	–0.33	***	–6.04	–0.30	***	–4.44	–0.26	***	–4.02	–0.001	***	–6.00
	Euroland	–	–0.33	***	–5.14	–0.22	**	–2.15	–0.34	***	–5.31	–0.000	***	–4.77
	Log(distance)	+	0.09	***	2.72	0.12	***	2.71	0.15	***	4.21	0.000		0.58
– Fin. development														
F_i	(Bank+Cap)/GDP, abroad	–	–0.23	**	–10.21	–0.12	***	–5.14	–0.31	***	–13.81	–0.000	***	–3.93
	Liquidity abroad	–	2.75	***	11.67	0.56	***	2.98	–3.91	***	–13.00	0.005	***	5.07
– Explicit frictions														
F_i	Transaction costs, host	+	1.33		0.49	–6.12	*	–1.89	–25.19	***	–4.16	0.007		0.77
	Dest. capital–import ctrls	+	0.04	***	12.05	0.05	***	9.24	0.02	***	3.75	0.000	***	6.00
H_l	Home capital–export ctrls	+	–0.00		–1.42	–0.01	*	–1.80	–0.00		–1.45	–0.000	**	–2.32
– Return skewness														
F_i	Skewness, host	–	0.32	***	14.96	0.27	***	14.46	1.42	***	42.45	0.001	***	7.32
Domestic investment costs $D(D_l)$														
– Information–related														
	Home GDP	?	0.41	***	3.24	0.40	***	2.71	0.27		1.63	0.001	***	3.56
	Misery index, home	–	–0.00	***	–2.65	–0.00		–1.47	–0.00		–1.02	–0.000	*	–1.88
	Crisis, home	–	–0.12	***	–5.39	–0.07	***	–2.45	–0.10	***	–3.49	–0.000	***	–3.22
	Opacity, home	–	–0.00	*	–1.94	–0.00	**	–1.96	–0.00	**	–2.01	–0.000	***	–3.32
	ICRGP, home	+	–0.00		–1.14	–0.00		–0.78	–0.00		–0.59	–0.000		–1.62
– Explicit frictions														
	Transaction costs, home	– or 0	4.59		1.33	6.32	*	1.41	–2.65		–0.56	0.007		0.86
– Financial Development														
	(Bank+Cap)/GDP, home	?	0.01		0.85	0.01		0.74	–0.01		–0.67	0.000		1.08
	Liquidity, home	+	–1.32	***	–5.19	–1.17	***	–3.45	–1.31	***	–3.94	–0.003	***	–4.62
Adjusted R^2			0.74			0.85			0.81			0.72		

can be explained by variances and covariances and despite their presumably well-developed information and trading machineries. Again consistent with information costs (domestic, this time), the misery index, the opacity index and the crisis indicator come up with a significantly negative sign.

All four interaction variables are significant, with the expected signs: sharing the same language or living in the same region reduces information costs while information costs are higher if the physical distance between the host and the home country increases. On top of the region-effect there is an information advantage for members of the Euro-area.

The level of development of the financial markets of the host country does influence implicit investment costs. We find that "outside" corporate financing as a fraction of GDP in the host country clearly decreases the costs of investing into that market, as logic suggests. Puzzlingly however, the host liquidity variable comes up with systematically significant coefficients of the wrong sign. For the full sample, we find that high trading costs in the home or the host country are positively correlated with higher differential international investment costs, but the evidence is indicative only, while in the 2003-2004 subsample, trading costs in the host country come up with a negative sign, which is not what one would normally expect. However, when we estimate the model with transaction costs as the single explanatory variable, the coefficient for trading costs in the home country becomes (insignificantly) negative, while trading costs in the host country come up with a significantly positive sign. In short, the unexpected signs for trading costs in the full regression seems to due to unexpected interactions with other variables. These results are consistent with Goetzmann and Kumar (2005), who find that transaction costs do not noticeably influence diversification decisions. In their study diversification choices are explained by investor specific characteristics. Here, the clearest explicit frictions in the case of inward investment costs turn out to be those caused by controls on capital imports, not transaction costs. Restrictions on capital exports have no clear effect.

Unexpectedly, the skewness indicator has a consistently positive significant sign. A potential explanation can be found in Bekaert, Erb, Harvey and Viskanta (1998): skewness is typical for emerging markets, and also changes over time, thus creating extra uncertainty.

There are two broad conclusions, at this stage. First, information variables are clearly important, with signs for their coefficients that make sense, while transaction costs and liquidity are

often insignificant or come up with signs that must mean they are proxying for something else. Second, home-country information variables do play a role, consistent with the idea that also in home markets there are information costs.

B.2 Estimated cost levels and trends

Table IV in the Appendix shows the full 36×36 matrix of estimated total costs of international investment for December 2004; tables for the other years are similar and can be obtained from the corresponding author. As a more digestible summary of the table, Figure 1 shows the estimated annual percentage cost to invest into a particular host country during the sample period, averaged across all home countries over the four years. It is clear from the figure that there is a huge difference between the international investment costs into the industrialized and the developing countries. Over the sample period, the average implicit inward investment costs into the developed countries range from only 0.26 per cent per annum in the United States to 2.8 percent per annum in Greece. Investment into developing countries resulted in a much higher implicit cost, and much more variability: average inward investment costs amounted to 3.5 percent per annum for Hungary, but investing in Turkey went with an average implicit investment cost estimated at 16 percent per annum.

Figure 2 shows the average inward investment costs for each country and each subperiod relative to the mean inward investment cost. The ranking of the countries based on inward investment costs does not differ much over the two subperiods. For the years 2001-2002 the top five of lowest inward investment costs countries is composed of the US, Hong Kong, Switzerland, the UK and Germany, while the top five countries for the years 2003-2004 are the US, the Netherlands, Switzerland, Canada and the UK. High- investment-cost countries are Turkey, the Russian Federation, Indonesia and Venezuela, for both subperiods.

Four years is a short period to verify whether costs have come down over time, so to get an idea of the evolution the implicit costs of international investment we apply the original the CK methodology for the nine countries (Canada, France, Germany, Italy, Japan, Spain, Sweden, the UK and the US) in their sample that have data on x_l^l over the period 1980-1997 (OECD data). We add the x_l^l data from the IMF surveys to extend the series. The risk tolerance parameter is fixed at 1.067, for comparability with our estimates.

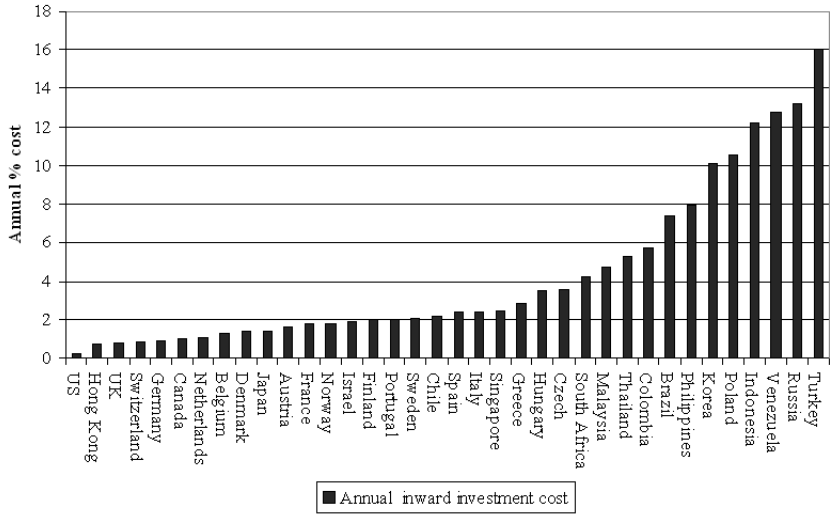

Figure 1: Annual average inward investment costs, 2001-2004

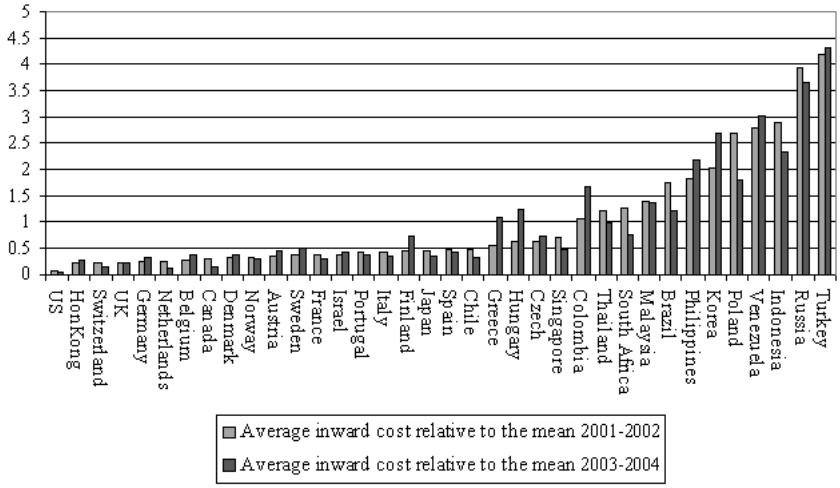

Figure 2: Inward investment costs relative to the mean per subperiod

Average inward investment costs divided by the mean inward investment cost for each subperiod

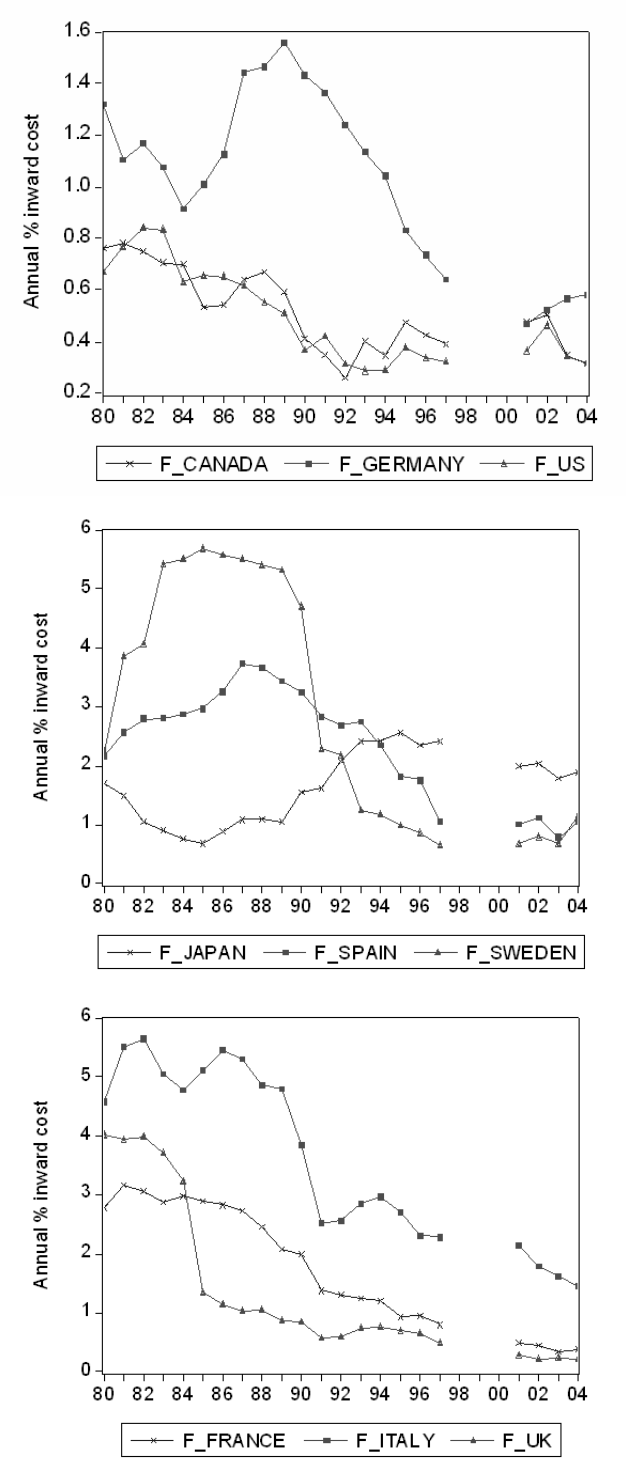

Figure 3: Evolution of annual inward investment costs, $\alpha = 1.067$

Annual inward investment costs are calculated following the CK (1996) methodology. Data on portfolio holdings until 1997 are from the OECD. No data is available for the period 1998-2000

Figure 3 shows the evolution of the annual average inward investment cost for the nine countries. By and large, implied costs have fallen over time even at constant risk tolerance. For two countries, Germany and Spain, implied costs were rising until the late eighties before the downward trend started; possibly, what we really see is not increased home bias due to rising costs but to proportionally large privatizations that strongly targeted the local small investor. Sweden's exceptionally high initial cost reflected capital controls, lifted in the later eighties; we see costs duly plummet as of then. Japan is a lone outsider, with the imputed cost of inward investments rising as its market slumped in the first half of the 1990s. Lastly, and most crucially, also CK style cost estimates for 2001-04 are falling, and their levels seem to be well in line with the general trend of the 1990s.

IV. Conclusion

In this paper we use actual portfolio holdings to estimate the implicit costs for an investor to diversify internationally. This integrates the work of Cooper and Kaplanis (1994) on costs of investments with the studies of determinants of international capital flows and yields a methodology that allows us to estimate the costs on inward and outward investment, their determinants, and the universal risk tolerance parameter simultaneously. We also account for interaction effects between two countries. The technology is applied to a fairly wide cross section of countries, 36 of them, over four years. We also apply the original CK algorithm to a smaller cross section of nine countries over 19 years.

One finding is that, consistent with earlier results of CK, Adler and Dumas (1983) and Coën (2001), inflation hedging plays no big role in explaining the home bias puzzle. We also find that the implicit costs to invest in less developed countries are substantially higher than the costs to invest in developed countries. Thus, investors find early-stage countries too costly, even taking into account the advantages of low correlation with major markets and the positive skewness in the returns of emerging countries. These countries typically have less developed financial markets, a lower GDP, and higher inflation and unemployment rates than the industrialized countries. They are also more likely to have suffered from a financial crisis. Most emerging countries have underdeveloped information channels and procedures, which can increase the

costs for both residents and foreigners to acquire information on certain companies, resulting in a total cost of foreign investment that is far higher than the explicit costs that are actually charged (transaction costs, withholding taxes). Indeed, while most information-related coefficients are significant with signs that make sense, this is far less the case with the cash-cost variables; thus, information and financial development seems to be the key.

Our estimates of the implicit costs to invest in a developed country, in contrast, are lower than estimates reported earlier (Cooper and Kaplanis, 1994; Coën, 2001). We show that the implicit costs have been trending downward over the last two decades, at least for the nine countries that have data over this period. As a result, foreign investors that enter mainstream markets face implicit investment costs below 2 percent per annum, and most of the time substantially below 2 percent.

Appendices

A1. Regional Classification

North America	*South America*	*Southern Africa*
Canada	Brazil	South Africa
United States	Chile	
	Colombia	
	Venezuela	

Northern Europe	*Eastern Europe*	*Southern Europe*	*Western Europe*
Denmark	Hungary	Greece	Austria
Finland	Poland	Italy	Belgium
Norway	Czech Republic	Portugal	France
Sweden	Russian Fed.	Spain	Germany
			Netherlands
			Switzerland
			United Kingdom

East Asia	*South East Asia*	*West Asia*
Hong Kong	Indonesia	Israel
Japan	Malaysia	Turkey
Korea, Rep. of	Philippines	
	Singapore	
	Thailand	

A2. Composition of the capital control indices

The AREAER capital account transactions are subdivided into fourteen categories. Following Miniane (2004), we add a fifteenth category. For each of the subdivisions, it is noted if there are capital controls on inflows and/or on outflows. We construct the indices of controls on

inflows and on outflows by using a dummy with a unit value if a capital control is present in the category and zero otherwise.

The capital account transactions are subdivided the following categories:

- Capital market securities: shares or other securities of a participating nature
- Capital market securities: bonds or other debt securities
- Money market instruments
- Collective investment securities
- Derivatives and other instruments
- Commercial credit operations
- Financial credit operations
- Guarantees, suretees, and financial backup facilities
- Direct investment
- Liquidation of direct investment (only for outflows)
- Real estate transactions
- Personal capital transactions
- Commercial banks and other credit institutions
- Institutional investors

The fifteenth category accounts for the presence of multiple exchange rate regimes.

A3. Estimates of the annual percentage cost of international investment

Each column of Table IV corresponds to the country of investment (host country), each row to an investing country (home country). For example, the second entry of the first row says that an Austrian investor faces an implicit investment cost of 0.55 per cent per annum to invest in Belgian shares. The standard deviation is a descriptive cross-country sigma for the column or row.

Table IV: **Estimated annual percentage cost of international investment, December 2004**

	host countries											
home	Austria	Belgium	Brazil	Canada	Chile	Colombia	Czech Rep	Denmark	Finland	France	Germany	Greece
Austria	0.57	0.55	7.22	1.21	2.41	6.20	3.92	1.48	1.73	1.12	0.38	2.44
Belgium	0.61	0.49	7.13	0.72	2.38	6.11	4.03	1.45	1.72	0.64	0.36	2.46
Brazil	1.79	1.60	2.36	1.00	1.34	3.55	37.0	1.33	2.15	1.95	1.11	3.03
Canada	2.08	1.12	6.94	0.47	2.31	5.83	4.30	1.54	2.48	1.37	1.29	3.54
Chile	2.28	2.03	5.11	1.26	0.95	2.70	4.71	1.70	2.73	2.48	1.42	3.85
Colombia	2.08	1.85	4.80	1.14	0.96	2.28	4.30	1.55	2.49	2.26	1.29	3.53
Czech Rep	1.74	1.61	6.63	1.11	2.21	5.69	1.51	1.34	2.21	1.99	1.11	3.15
Denmark	1.98	1.76	7.20	1.20	2.40	6.16	4.04	0.58	1.70	2.17	1.21	3.46
Finland	1.33	1.19	6.64	1.11	2.22	5.69	3.82	0.97	0.64	1.47	0.83	2.29
France	0.91	0.47	6.42	0.65	2.15	5.50	3.66	1.32	1.56	0.57	0.55	2.21
Germany	0.63	0.54	7.46	1.24	2.49	6.39	4.17	1.50	1.79	1.12	0.38	2.56
Greece	1.42	1.29	7.10	1.20	2.37	6.12	4.13	1.50	1.74	1.58	0.90	0.95
Hong Kong	2.34	2.10	7.98	0.81	2.65	6.85	4.85	1.74	2.79	2.57	1.46	3.96
Hungary	1.76	1.68	6.77	1.13	2.26	5.81	2.69	1.39	2.27	2.06	1.16	3.17
Indonesia	1.96	1.75	6.58	1.12	2.18	5.71	4.05	1.46	2.34	2.15	1.22	3.30
Israel	2.04	1.84	7.16	0.73	2.39	6.18	4.24	1.53	2.47	2.26	1.28	3.36
Italy	1.25	1.14	6.38	1.07	2.13	5.48	3.64	1.34	1.56	1.39	0.79	1.54
Japan	2.22	1.99	7.57	1.26	2.50	6.44	4.60	1.65	2.64	2.43	1.38	3.76
Korea	1.77	1.58	6.04	1.00	2.00	5.15	3.65	1.31	2.10	1.94	1.10	2.99
Malaysia	2.16	1.93	7.30	1.24	2.42	6.32	4.47	1.61	2.58	2.37	1.35	3.64
Netherlands	0.96	0.48	6.74	1.12	2.25	5.78	3.81	1.36	1.62	1.01	0.56	2.32
Norway	1.95	1.72	6.97	1.16	2.33	5.97	4.00	1.00	1.64	2.13	1.19	3.37
Philippines	2.05	1.83	6.95	0.70	2.30	5.97	4.24	1.52	2.44	2.25	1.28	3.46
Poland	1.73	1.59	6.42	1.07	2.15	5.51	2.56	1.30	2.11	1.96	1.10	3.05
Portugal	1.42	1.25	4.15	1.15	2.30	5.90	4.09	1.47	1.72	1.52	0.87	1.73
Russia	1.62	1.46	5.79	0.97	1.93	4.96	2.41	1.20	1.89	1.80	1.02	2.77
Singapore	2.17	1.95	7.34	0.75	2.44	6.36	4.50	1.62	2.59	2.38	1.35	3.67
South Africa	1.91	1.71	6.25	0.66	2.09	5.48	3.96	1.43	2.30	2.09	1.19	3.22
Spain	1.33	1.17	6.53	1.10	1.32	3.39	3.84	1.39	1.62	1.42	0.82	1.63
Sweden	1.86	1.66	6.70	1.11	2.24	5.74	3.83	0.96	0.92	2.05	1.15	3.23
Switzerland	0.83	0.73	7.04	0.71	2.35	6.04	3.96	1.45	2.39	0.89	0.51	3.36
Thailand	2.10	1.88	7.12	1.20	2.37	6.15	4.34	1.56	2.50	2.30	1.31	3.53
Turkey	1.61	1.47	5.77	0.97	1.93	4.97	3.35	1.22	1.96	1.80	1.02	2.63
UK	1.40	1.18	6.96	0.70	2.33	5.97	4.00	1.43	2.36	1.45	0.84	3.37
US	2.15	1.91	7.15	0.48	2.38	6.00	4.44	1.59	2.56	2.33	1.33	3.65
Venezuela	2.04	1.81	4.72	1.11	0.95	2.33	4.21	1.51	2.44	2.21	1.26	3.45
Average	**1.67**	**1.45**	**6.48**	**0.99**	**2.12**	**5.46**	**3.89**	**1.40**	**2.08**	**1.82**	**1.04**	**2.99**
Std. dev.	**0.51**	**0.49**	**1.09**	**0.23**	**0.45**	**1.15**	**0.67**	**0.23**	**0.50**	**0.54**	**0.32**	**0.72**

	host countries											
home	Hong Kong	Hungary	Indonesia	Israel	Italy	Japan	Korea	Malaysia	Netherlands	Norway	Philippines	Poland
Austria	0.64	3.66	8.32	2.01	1.96	1.00	7.41	3.24	0.68	1.78	6.34	7.73
Belgium	0.63	3.86	8.25	2.02	1.97	0.99	7.34	3.22	0.38	1.75	6.28	7.86
Brazil	0.54	3.49	6.94	1.75	2.48	0.84	6.28	2.72	1.19	1.58	5.33	7.10
Canada	0.38	4.05	8.18	1.24	2.89	0.97	7.24	3.20	1.37	1.82	3.75	8.24
Chile	0.68	4.44	8.76	2.23	3.16	1.06	7.93	3.44	1.51	2.01	6.72	9.04
Colombia	0.62	4.05	8.15	2.05	2.88	0.97	7.25	3.19	1.37	1.83	6.19	8.25
Czech Rep	0.58	2.48	7.64	1.86	2.53	0.92	6.80	2.98	1.20	1.62	5.81	5.07
Denmark	0.63	3.87	8.29	2.03	2.80	0.99	7.36	3.23	1.29	1.22	6.31	7.75
Finland	0.58	3.61	7.61	1.87	1.87	0.91	6.75	2.97	0.88	1.15	5.78	7.21
France	0.57	3.49	7.44	1.82	1.77	0.89	6.62	2.90	0.59	1.59	5.67	7.13
Germany	0.66	4.01	8.62	2.11	2.06	1.03	7.67	3.36	0.66	1.82	6.56	8.16
Greece	0.63	3.84	8.16	1.93	1.40	0.98	7.30	3.18	0.96	1.80	6.23	7.91
Hong Kong	0.23	4.56	8.61	1.38	3.26	0.74	5.46	2.02	1.56	2.07	3.81	9.26
Hungary	0.60	1.45	7.79	1.88	2.57	0.94	6.94	3.04	1.25	1.67	5.93	5.19
Indonesia	0.55	3.80	2.89	1.90	2.72	0.88	6.53	1.93	1.30	1.73	3.89	7.74
Israel	0.38	3.96	8.17	0.75	2.82	0.99	7.33	3.18	1.37	1.83	3.77	8.10
Italy	0.56	3.41	7.37	1.78	0.72	0.89	6.58	2.87	0.85	1.60	5.62	7.07
Japan	0.45	4.32	8.33	2.17	3.09	0.39	5.05	3.25	1.47	1.95	6.20	8.78
Korea	0.35	3.44	6.62	1.72	2.46	0.54	2.23	2.58	1.17	1.55	4.92	6.98
Malaysia	0.36	4.20	5.46	2.09	3.00	0.97	7.20	1.21	1.44	1.91	4.29	8.54
Netherlands	0.60	3.65	7.80	1.91	1.87	0.93	6.93	3.04	0.35	1.64	5.93	7.41
Norway	0.61	3.80	8.03	1.97	2.74	0.96	7.12	3.13	1.27	0.69	6.10	7.63
Philippines	0.33	3.98	5.34	1.20	2.85	0.90	6.68	2.08	1.36	1.81	2.23	8.10
Poland	0.56	2.42	7.38	1.79	2.48	0.88	6.56	2.88	1.18	1.57	5.62	2.87
Portugal	0.62	3.86	8.04	1.97	1.40	0.97	7.17	3.14	0.93	1.76	6.13	7.88
Russia	0.50	2.26	6.60	1.61	2.28	0.79	5.85	2.57	1.09	1.43	5.02	4.54
Singapore	0.37	4.23	5.43	1.27	3.02	0.98	7.24	1.23	1.45	1.92	2.60	8.60
South Africa	0.34	3.72	7.30	1.12	2.64	0.90	6.65	2.86	1.27	1.70	3.40	7.58
Spain	0.58	3.63	7.62	1.86	1.31	0.92	6.80	2.97	0.88	1.66	5.81	7.43
Sweden	0.59	3.63	7.70	1.89	2.63	0.92	6.83	3.00	1.23	1.13	5.85	7.25
Switzerland	0.62	3.77	8.14	1.98	1.61	0.98	7.25	3.18	0.91	1.74	6.20	7.75
Thailand	0.58	4.07	5.46	2.03	2.91	0.94	6.96	2.08	1.39	1.85	4.16	8.28
Turkey	0.51	3.11	6.61	1.12	2.24	0.80	5.91	2.58	1.09	1.45	5.04	6.39
UK	0.37	3.81	8.08	1.19	2.71	0.97	7.18	3.15	0.88	1.71	3.71	7.75
US	0.39	4.18	8.46	1.28	2.98	1.01	7.49	3.30	1.42	1.88	3.88	8.50
Venezuela	0.61	3.96	8.00	2.00	2.82	0.95	7.11	3.12	1.34	1.79	6.08	8.07
Average	**0.52**	**3.67**	**7.43**	**1.74**	**2.41**	**0.91**	**6.75**	**2.83**	**1.13**	**1.67**	**5.20**	**7.48**
Std. Dev.	**0.12**	**0.63**	**1.22**	**0.37**	**0.61**	**0.13**	**0.98**	**0.55**	**0.32**	**0.27**	**1.20**	**1.29**

	host countries													
home	Portugal	Russia	Singapore	S. Africa	Spain	Sweden	Switzerland	Thailand	Turkey	UK	US	Venezuela	**Average**	**Std. Dev.**
Austria	1.64	13.13	1.65	4.01	1.76	2.17	0.45	3.54	7.86	0.69	0.31	8.86	**3.33**	**3.13**
Belgium	1.60	13.13	1.63	3.97	1.72	2.14	0.44	3.51	7.93	0.65	0.31	8.72	**3.29**	**3.15**
Brazil	1.19	11.62	1.38	3.25	2.14	1.93	0.95	2.98	7.00	0.85	0.26	5.09	**2.88**	**2.42**
Canada	2.30	13.46	0.98	2.38	2.49	2.23	0.67	3.49	8.17	0.59	0.12	8.32	**3.38**	**3.03**
Chile	2.52	14.78	1.74	4.14	1.65	2.46	1.21	3.78	8.91	1.08	0.33	3.90	**3.57**	**3.06**
Colombia	2.29	13.49	1.62	3.85	1.50	2.24	1.10	3.49	8.15	0.99	0.29	3.40	**3.27**	**2.80**
Czech Rep	2.10	8.64	1.51	3.68	2.25	1.97	0.96	3.25	7.26	0.87	0.29	8.12	**3.07**	**2.39**
Denmark	2.29	13.04	1.64	4.00	2.46	1.50	1.06	3.53	7.96	0.95	0.31	8.81	**3.53**	**3.00**
Finland	1.52	11.74	1.51	3.69	1.64	0.82	0.99	3.24	7.34	0.89	0.29	8.13	**3.09**	**2.82**
France	1.44	11.88	1.47	3.57	1.54	1.95	0.40	3.17	7.16	0.58	0.28	7.86	**2.99**	**2.82**
Germany	1.68	13.68	1.71	4.15	1.81	2.23	0.46	3.67	8.27	0.69	0.32	9.13	**3.47**	**3.26**
Greece	1.17	13.06	1.61	3.92	1.26	2.19	1.06	3.47	7.49	0.97	0.31	8.74	**3.33**	**3.05**
Hong Kong	2.63	15.00	1.02	2.64	2.84	2.52	1.25	3.61	9.11	0.68	0.21	9.81	**3.73**	**3.31**
Hungary	2.15	8.80	1.54	3.75	2.31	2.03	0.99	3.31	7.31	0.90	0.29	8.31	**3.14**	**2.44**
Indonesia	2.19	12.57	0.97	3.60	2.37	2.11	1.04	2.17	7.60	0.94	0.29	8.19	**3.16**	**2.67**
Israel	2.31	13.22	0.98	2.38	2.50	2.22	1.09	3.48	5.55	0.60	0.19	8.83	**3.37**	**2.92**
Italy	1.03	11.78	1.46	3.54	1.11	1.95	0.56	3.14	6.98	0.85	0.28	7.83	**2.99**	**2.77**
Japan	2.49	14.23	1.65	4.18	2.70	2.38	1.18	3.54	8.67	1.06	0.33	9.24	**3.77**	**3.10**
Korea	1.98	11.30	1.31	3.32	2.14	1.89	0.94	2.80	6.88	0.84	0.26	7.38	**2.95**	**2.45**
Malaysia	2.42	13.85	0.62	3.99	2.62	2.32	1.15	2.34	8.39	1.03	0.32	9.05	**3.50**	**3.00**
Netherlands	1.52	12.39	1.54	3.75	1.63	2.02	0.70	3.32	7.50	0.61	0.29	8.25	**3.16**	**2.94**
Norway	2.22	12.65	1.59	3.88	2.40	1.44	1.04	3.42	7.77	0.92	0.30	8.53	**3.43**	**2.91**
Philippines	2.30	13.13	0.64	2.30	2.49	2.20	1.09	2.27	7.97	0.59	0.18	8.56	**3.21**	**2.87**
Poland	2.05	8.25	1.46	3.56	2.20	1.89	0.95	3.14	7.00	0.86	0.28	7.87	**2.95**	**2.27**
Portugal	0.61	13.02	1.59	3.84	1.15	2.15	1.04	3.43	7.82	0.93	0.30	8.41	**3.21**	**2.97**
Russia	1.86	4.52	1.30	3.21	2.01	1.73	0.87	2.80	6.34	0.79	0.25	7.10	**2.64**	**1.92**
Singapore	2.44	13.95	0.55	2.42	2.64	2.34	1.16	2.37	8.45	0.63	0.19	9.11	**3.38**	**3.07**
South Africa	2.12	12.39	0.88	1.36	2.30	2.07	1.02	3.14	7.44	0.55	0.17	7.85	**3.14**	**2.75**
Spain	1.01	12.29	1.51	3.64	0.65	2.03	0.97	3.25	7.37	0.87	0.28	4.83	**2.94**	**2.73**
Sweden	2.14	12.01	1.52	3.72	2.31	0.82	1.00	3.27	7.42	0.89	0.29	8.20	**3.27**	**2.79**
Switzerland	2.21	12.98	1.61	3.91	2.36	2.13	0.41	3.47	7.78	0.66	0.30	8.62	**3.36**	**3.05**
Thailand	2.35	13.43	1.06	3.90	2.54	2.25	1.12	1.30	8.14	1.00	0.31	8.80	**3.42**	**2.90**
Turkey	1.85	10.50	1.31	3.19	1.99	1.77	0.87	2.81	2.58	0.79	0.25	7.10	**2.79**	**2.30**
UK	2.18	12.89	0.97	2.34	2.35	2.11	0.73	3.44	7.80	0.37	0.18	8.52	**3.26**	**2.98**
US	2.37	13.90	1.01	2.45	2.57	2.31	1.14	3.61	8.43	0.61	0.13	8.56	**3.55**	**3.09**
Venezuela	2.24	13.20	1.58	3.78	1.47	2.19	1.08	3.42	7.98	0.96	0.29	3.20	**3.20**	**2.74**
Average	**1.96**	**12.33**	**1.34**	**3.42**	**2.05**	**2.02**	**0.92**	**3.17**	**7.55**	**0.80**	**0.27**	**7.81**		
Std. Dev.	**0.50**	**2.04**	**0.34**	**0.69**	**0.52**	**0.38**	**0.25**	**0.52**	**1.10**	**0.17**	**0.06**	**1.64**		

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